Application No.: 10/065,678   Docket No.:   JCLA9038

AMENDMENTS

In The Claims:

Please amend the claims as follows:

1.   (currently amended) A method for recovering a digital data content in a communication system, wherein the digital data content has been converted into an analog signal for transmitting from a transmitter to a receiver through a communication channel, the method comprising:

receiving the analog signal by the receiver; converting the analog signal into a sampled digital signal, based on a local sampling clock;

performing a interpolation process to interpolate the sampled digital signal at an interpolation point for generating an interpolated digital signal;

performing a timing tracking process to determine the interpolation point where the interpolation is to be taken at and determine whether or not the interpolation point is changed and different from the previous determined interpolation point;

estimating a channel impulse response described by a set of coefficients based on the interpolated digital signal when the interpolation point is changed;

detecting the digital data content from the interpolated digital signal and the estimated coefficients of channel impulse response;

performing an update process if the interpolation point has been changed, wherein the update process comprises:

updating the filter coefficients used in the interpolation process according to the interpolation point;

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performing a retraining process to update the set of coefficients of the channel

impulse response, according to the interpolated digital signal, wherein ~~while performing~~

~~the retraining process,~~ the timing tracking process ~~optionally is temporarily paused~~ is

simultaneously paused as the interpolation point is changed, and the timing tracking

process is simultaneously awakened as the retraining process is accomplished.

2.   (original)   The method in claim 1, further comprises an initialization process to

produce an initial condition, wherein the initial condition includes an initial set of coefficients of

channel impulse response and initial filter coefficients used in the interpolation process

3.   (original)   The method of claim 1, wherein the timing tracking process is operated,

according to the interpolated digital signal, the detected digital data content, or a pilot signal

containing timing information for determining the interpolation point.

4.   (original)   The method of claim 1, wherein the timing tracking process is

performed with the information of the estimated channel impulse response.

Claims 5-7   (cancelled)

8.   (currently amended)   An apparatus for recovering a digital data content in a

communication system, used in a receiver, wherein the digital data content has been converted

into an analog signal at a transmitter for transmission to the receiver through a communication

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channel, the apparatus comprising:

an analog-to-digital converter (ADC), used to receive the analog signal and convert into a

sampled digital signal according to a local sampling clock;

an interpolation unit, receiving the sampled digital signal from the ADC, wherein

interpolation unit is used to interpolate the sampled digital signal at an interpolation point and

output an interpolated digital signal;

a channel estimator, receiving an output of the interpolation unit and a retraining signal,

wherein the channel estimator produces a set of coefficients for representing a shape of the

channel impulse response, and perform a retraining process to update the coefficients when a

retraining signal is received;

a data detector, receiving the interpolated digital signal from the interpolation unit and an

information from the channel estimator, including the set of coefficients for the channel impulse

response, so as to recover the interpolated digital signal back to the current actual digital data

content; and

a timing tracking unit, used to determine the interpolation point, and generate the

retraining signal when the interpolation point is changed and different from the previous

determined interpolation point,

wherein ~~when the channel estimator performs the retraining process,~~ the timing tracking

unit is ~~temporarily~~ simultaneously paused <u>to perform retraining process while the interpolation</u>

<u>point is changed , and the timing tracking unit is simultaneously awakened as the channel</u>

<u>estimator finishes the retraining process.</u> ~~by option.~~

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9.   (original) The apparatus of claim 8, wherein when the apparatus is operated under an

initial stage before actually transmitting actual desired data, the channel estimator determines an

initial set of coefficients of the channel impulse response, and the interpolation unit determines

the filter coefficients for interpolation.

Claims 10-11   (cancelled)

12.   (original) The apparatus of claim 8, wherein coefficients of the channel impulse

response from the channel estimator is further connected to the timing tracking unit for providing

the information of the channel impulse response

13.   (original) The apparatus of claim 8, wherein the timing tracking unit can receive

the current actual digital content, the interpolated digital signal, or a pilot signal containing

timing information to determine the interpolation point.

14.   (original) The apparatus of claim 8, wherein the ADC has a sampling rate larger

than and close to a Nyquist rate of the received analog signal.

15.   (original) The apparatus of claim 8, wherein the interpolation unit includes a digital

filter with finite-length filter coefficients.

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16.   (original) The apparatus of claim 15, wherein the number of the filter coefficients is two.

17.   (original) The apparatus of claim 8, wherein a time interval between two adjacent sampling clock points are evenly divided into a number of sub-time intervals, so that a set of time points is formed, the timing tracking unit tracks an actual interpolation point, chooses the one of the set of the time points closet to the actual interpolation point, and outputs the chosen time point as the interpolation point to the interpolation unit.